## ACADEMIC CALENDAR FOR 2004–2005

### Fall Semester 2004

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### Spring Semester 2005

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Early Registration for Spring 2005

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Graduate Students: Last Day to Withdraw from Courses
Biochemistry
Biology
Catholic Studies
Chemistry
Chinese
Classics
Classical Archaeology
Cognitive Science
Comparative Literature
Computer Science
Culture and Politics
Economics
English
Environmental Studies
French
German
Government
Greek
Hebrew
History
Interdisciplinary Studies
Italian
Japanese
Justice and Peace Studies
Linguistics
Mathematics

Medieval Studies
Philosophy
Physics
Political Economy
Portuguese
Psychology
Russian
Russian Literature and Culture (in Translation)
Social & Political Thought
Sociology
Spanish
Theology
Women's Studies

Certificate Programs
The following Certificate Programs, offered through the School of Foreign Service, are available to Georgetown College students:
African Studies
Arab Studies
Asian Studies
European Studies
Latin American Studies
Islam and Muslim-Christian Understanding
Russian and East European Studies
Science, Technology, & International Affairs

I. DEGREE REQUIREMENTS
The following are the graduation requirements for all students in Georgetown College. Each degree candidate must:

- Complete a minimum of 120 semester hours and 38 to 40 semester courses. To meet the minimum of 120 credit hours, a student may need as many as 40 courses; Bachelor of Science candidates will exceed the 120 credit minimum by meeting the 38 course minimum. In counting courses, the student should note the following definitions of a course. An intensive language course for more than three credits counts as one course. A one-credit offering is not computed in the course count. A two-credit science laboratory not related to a lecture, or any other course valued at two credits is computed as a half course. A science lecture and accompanying laboratory is counted as one course, even if the lecture and laboratory are listed separately and even if they are taken in separate semesters. Non-credit leisure and recreation courses do not count toward graduation.

- Complete the following General Education requirements:
  - Literature and Writing 2 courses
  - History 2 courses
  - Philosophy 2 courses
  - Theology 2 courses
  - Math/Science 2 courses
  - Social Science 2 courses
  (except biology, biochemistry, chemistry, and B.S. physics majors)

- Mastery of a foreign language through the intermediate level
- Declare a major field of concentration and complete all requirements for the major as specified under Departmental Programs below. In addition to their major, students in the College may chose to minor in any one of the College's approved minors. Students may double major, double major with a minor, or major in one field with two minors. A minor is not required.

- Achieve a final cumulative academic average of 2.0 or better.

- Language majors beginning language study below the expository writing level must enroll in intensive language course work.

- Students who enter the College with declared majors in a language, mathematics, or science are expected to enroll in at least one course in their major each semester throughout the four undergraduate years.

- Language and linguistics majors must achieve at least a 2.5 overall in the major in order to graduate.

- Language majors must participate in an overseas study program.

II. GENERAL EDUCATION REQUIREMENTS
The general education requirements are ordinarily fulfilled in the student's first and second years.
MATH-001 Pre-Calculus

This course is designed to assist students whose high school mathematics background is insufficient for the standard first-year mathematics courses. It is primarily intended as a preparation for MATH-003. Topics include: algebraic operations, factoring, exponents and logarithms, polynomials, rational functions, and the logarithmic and exponential functions. Graphing and word problems will be stressed. This course is not intended to complete the math/science requirement in the College. Fall.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-003 Short Course in Calculus

Professors Benke, Luo and Nhieu

This one semester course is intended to introduce the principal concepts of differential and integral calculus of functions of one variable. These concepts are presented in a straightforward, intuitive manner, with emphasis on the computational aspects of the calculus. Topics include: differentiation, integration, the logarithmic and exponential functions. Applications to curve sketching, optimization problems, and exponential growth and decay problems will be given. Prerequisite: MATH-001 or equivalent. This course, in conjunction with a core math/science course, may be used toward completion of the College math/science requirement. Fall and Spring.

Other academic years
There is information about this course number in other academic years:

- 2006-2007

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-006 Statistics with Exploratory Data Analysis

2004-2005 Course Catalog

MATH-006 Statistics with Exploratory Data Analysis

Professors Engler and Stein

The primary objective of this beginning course in statistics is to have students learn and understand statistical concepts without being overwhelmed by cumbersome formulae and computations. The emphasis will be on data exploration and graphical techniques. Topics to be covered will include descriptive statistics, measures of center and spread, linear regression, probability theory, sampling, random variables and probability distributions. Uniform, discrete, binomial, normal, t and chi-square distributions will be among those used to introduce statistical inference, including estimation and hypothesis testing. Considerable use will be made of video tapes and computers. All classes will be held in the computer lab where the statistical software MINITAB will be taught and used to simplify computation and enhance graphical presentations. A computer tutorial will also be used. Minimum computer ability is recommended (but not required). This course is regarded as a core course (or SONY core course, as appropriate) for completion of the math/science requirement in the College. Fall and Spring.

Other academic years

There is information about this course number in other academic years:

- 2005-2006
- 2006-2007
- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012

More information

Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-007 Introduction to Mathematical Modeling

Professor Sandefur

This course will use mathematics to study problems arising in areas such as Genetics, Finance, Medicine, and Economics. Students will learn how to model a real situation, such as steroid-testing in athletes or environmental cleanup. The model will be analyzed in relationship to the real world, such as making recommendations for optimal steroid testing to avoid cheating or determining the minimum time required to adequately clean up a polluted lake. Often the results will be counterintuitive, such as finding that an increase in the rate of wild-life harvesting may actually decrease the long-term harvest, or that a lottery prize that is paid out over a number of years is worth far less than its advertised value. Students should have taken mathematics through Algebra II, and preferably, Precalculus. This course is regarded as a core course (or SONY core course, as appropriate) for completion of the math/science requirement in the College. Fall and Spring.

Other academic years
There is information about this course number in other academic years:

- 2005-2006
- 2006-2007
- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-035 Calculus 1

This is the first part of the four semester calculus sequence (Math-035-036 and 137-150) for mathematics and science majors. Topics include limits, derivatives, techniques of differentiation, applications of the derivative, the Riemann integral, the trigonometric and inverse trigonometric functions, and the logarithmic and exponential functions. Fall and Spring.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
- 2007-2008
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- 2011-2012

More information
Look for this course in the schedule of classes.

The academic department website for this program may provide other details about this course.
MATH-036 Calculus II

MTTH-O 36 Calculus II

Professors Fan and Luo
A continuation of MATH-035.

Topics include techniques of integration, applications of the definite integral, improper integrals, Newton's method and numerical integration, sequences and series including Taylor's theorem and power series, and elementary separable and first and second order linear differential equations. Fall and Spring.

Other academic years
There is information about this course number in other academic years:

- 2005-2006
- 2006-2007
- 2007-2008
- 2008-2009
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- 2011-2012

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-040 Probability and Statistics

Professors Caraballo and Sullivan

Topics include graphical and numerical methods for describing data, probability and sampling distributions, estimation, hypothesis testing, and simple linear regression with inference. Some knowledge of calculus is desirable but not required. Fall and Spring.

Other academic years
There is information about this course number in other academic years:
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More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-137 Multivariable Calculus

Professors Chang and Vogt

A continuation of MATH-036.

This is a first course in vector analysis and the differential and integral calculus of functions of many variables. Topics include vector analysis in n-space, differentiation of real and vector valued functions of many variables, the chain rule, extrema of real valued functions, constrained extrema and Lagrange multipliers, vector fields in 3-space, the divergence and curl of a vector field, conservative fields, double and triple integrals, change of variables in multiple integrals, path and surface integrals, and the theorems of Green, Gauss, and Stokes. Fall and Spring.

Other academic years

There is information about this course number in other academic years:

- 2005-2006
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More information

Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-150 Linear Algebra

Professor Benke

Normally taken after MATH-137.

This course presents the basic theory and methods of finite dimensional vector spaces and linear transformations on them. Topics include: matrices and systems of linear equations; vector spaces, bases, and dimension; linear transformations, kernel, image, matrix representation, basis change, and rank; scalar products and orthogonality; determinants; eigenvalues, eigenvectors, diagonalization of symmetric matrices, positive definite matrices. Fall and Spring.

Other academic years
There is information about this course number in other academic years:

- 2005-2006
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More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-203 Abstract Algebra

This is a rigorous introduction to algebraic structures and their homomorphisms with emphasis on proofs. Topics from group theory will include permutation groups and Sylow theory. Topics from ring theory will include integral domains, unique factorization domains, and polynomial rings. Spring. Prerequisite: MATH-150 and MATH-208 or consent of instructor.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
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More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-208 Foundations of Mathematics

Professor Sandefur

This course will cover fundamental concepts and methods and is intended to give a background for much of what is often taken for granted in Mathematics. Topics include an introduction to the methods of proof; set theory; proofs by induction; relations and functions; partitions and orderings; development of the number system based on the Peano Axioms; countable and uncountable sets. The equivalence of the axiom of choice, the well-ordering principle, and Zorn's lemma will be discussed as time permits. Fall and Spring.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
- 2007-2008

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-211 Number Theory

Basic properties of the integers: divisibility, primes, unique factorization. Congruences: the theorems of Wilson, Fermat, and Euler. Number theoretic multiplicative functions. Diophantine equations. Distribution of primes. Applications to computer science and modern cryptography. (Not offered 2004-05)

Other academic years
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- 2005-2006
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More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-212 Numerical Analysis

Staff
Development of methods for solving numerical problems on digital computers. Problems discussed include solution of systems of linear and nonlinear equations, interpolation, numerical integration, and solution of ordinary differential equations. Work will include solving practical problems using the computer. Spring.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
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More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-215 Differential Geometry

This course treats the differential geometry of curves and surfaces in n-dimensional space, including parametrizations and Frenet formulas for plane and space curves, the theory of surfaces and their fundamental forms, and the geometry of geodesics. Prerequisites: Multivariable Calculus (MATH-137) and Linear Algebra (MATH-150). Fall.

Other academic years
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More information
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The academic department web site for this program may provide other details about this course.
Combinatorics

Professor Kainen

This course will begin with a brief survey of sets, functions, logic, equivalence relations, and partial orders. The principal topics will include permutations and combinations, recurrence relations, generating functions, and inclusion-exclusion principles, with assorted applications. The course will conclude with a brief introduction to graph theory. Fall.
This course treats the basic concepts of graph theory, including graphs and digraphs, trees, networks, Eulerian and Hamiltonian graphs, and Ramsey numbers. Applications to packing and scheduling problems, the traveling salesman problem, and map colorings (including the famous four color theorem) will be considered. (Not offered 2004-05)
MATH-225 Optimization | 2004-2005 Course Catalog

2004-2005 Course Catalog

MATH-225 Optimization

Topics of significance in operations research, game theory, and economics will be treated. Examples are linear programming, Newton's method, conjugate gradient methods, Kuhn-Tucker theory, dynamic programming, spanning trees, and Nash equilibria. Spring.

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More information

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The academic department web site for this program may provide other details about this course.
MATH-231 Analysis I

This is the first part of the two semester advanced calculus sequence (Math-231-232) which provides a rigorous treatment of topics in calculus with the emphasis on proofs of major theorems. Topics include the basic properties of the real numbers and n-dimensional Euclidean space, the basic topology of metric spaces including compactness and connectedness, the theory of numerical sequences and series, and the properties of continuous functions on metric spaces. Fall.

Other academic years
There is information about this course number in other academic years:

- 2005-2006
- 2006-2007

More information
Look for this course in the schedule of classes.

The academic department website for this program may provide other details about this course.
MTH-232 Analysis II

Professor Chang

A continuation of MATH-231.

Topics include differentiation, integration theory, the fundamental theorem of calculus, and sequences and series of functions. Spring.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007

More information
Look for this course in the schedule of classes.

The academic department website for this program may provide other details about this course.
MATH-233 Mathematical Statistics I

This is the first part of the two semester sequence in probability and statistics (MATH-233-234). This first semester provides the background probability theory required for a serious study of statistics. Topics include random variables, an overview of discrete and continuous probability distributions including multivariate distributions, expectations, stochastic independence, joint and conditional distributions, and the central limit theorem. Additional topics, as time permits, will be chosen from among: generating functions and Laplace transforms, random walks and Markov chains, and the Poisson process. (Fall 2005)
MATH-234 Mathematical Statistics II

A continuation of MATH-233.

This semester concentrates on statistics. Topics include descriptive statistics, sampling theory, statistical inference, construction and properties of point estimators, confidence intervals, hypothesis testing in parametric models, linear regression, analysis of variance, Chi-square tests, simple sequential tests, and distribution-free methods. (Spring 2006)

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
- 2007-2008

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
MATH-236 Complex Variables

Complex numbers. Analytic functions including exponential, logarithmic and trigonometric functions of a complex variable. Geometric and mapping properties of analytic functions. Contour integration, Cauchy's theorem, the Cauchy integral formula. Power series representations. Residues and poles, with applications to the evaluation of integrals. Conformal mapping and applications as time permits. Fall.
MATH-241 Transform Methods/Partial Differential Equations

This course deals with the leading partial differential equations of applied mathematics, and with methods of solving them, such as Fourier series and integrals, Bessel functions, Legendre polynomials, and the Sturm-Liouville method. Applications will include vibrating strings, wave motion, and signal processing. Spring.
MATH-251 Ordinary Differential Equations

This course provides an introduction to the theory, techniques, and applications of ordinary differential equations. Topics include first order equations, second order linear equations, series solutions, the method of Laplace transforms, systems of equations, and an introduction to nonlinear equations and stability theory. Fall.
This course considers topics in applied mathematics chosen by the instructor. Possible topics include mathematical biology, neural networks, game theory, general relativity, and fluid dynamics. Prerequisite: Permission of the instructor. Spring
Tutorials on special topics are offered at the discretion of the instructor and with the permission of the Departmental Chair.

Other academic years
There is information about this course number in other academic years:
- 2005-2006
- 2006-2007
- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012

More information
Look for this course in the schedule of classes.

The academic department web site for this program may provide other details about this course.
### Fall 2004

#### Marketing

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### Mathematics

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### Management

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